CSE PhD MAJOR/MINOR REQUIREMENTS Under Semesters

General Requirements
10 letter graded credits are required for the major - core classes counted towards the qualification process cannot be counted.
6 credits (at least 5 letter graded) are required for each of the 2 minors - core classes used towards the qualification process cannot be counted.

Additional Notes
1. Students can take major and minors outside of the list below. They should contact a faculty member in that area prior to taking any of the classes.
2. Input from High-end computing and Networking areas was not received in time for this update. However, students can still continue to major and minor in these areas - please see above.
3. Students could meet the requirements for the major/minors listed below using an alternative set of classes, including possibly graduate classes taken at another institution. They should contact their major/minor advisor to discuss this in ADVANCE.

Notes for students meeting these requirements during the transition

A. They must have a total of 31 semester credit equivalent (i.e. semester credits + 2/3*quarter credits) over core, major, and 2 minors.
B. At least 5 semester credit equivalent in each minor and 9 semester credit equivalent in major.
C. No specific rules (beyond min. credit requirements) have been developed for students who will take classes in any major or minor across transition. Please contact your major/minor advisor(s) to get approval for your plan in advance.
Software Engineering and Programming Languages

Major Course requirements

* Required: 6341 (Foundations of Programming Languages), 6231 (Formal Foundations of Software Engineering)

* Electives: 6333 (Distributed Algorithms), 5343 (Compiler Design and Implementation), 6321 (Computability and Complexity), 5234 (Distributed Enterprise Computing), 5235 (Applied Enterprise Architectures and Services), 5239/5349 taught by SE&PL faculty

Subject to the Following Constraints:

* At least 6 credit-hours from courses other than 5239/5349

* At least 2 credit-hours from 5239/5349

Minor

* Required: 6341 (Foundations of Programming Languages), 6231 (Formal Foundations of Software Engineering)

* Electives: 6333 (Distributed Algorithms), 5343 (Compiler Design and Implementation), 6321 (Computability and Complexity), 5234 (Distributed Enterprise Computing), 5235 (Applied Enterprise Architectures and Services), 5239/5349 taught by SE&PL faculty

Graphics

Major

Required: 5542 (Real-time Rendering) 5543 (Geometric Modeling), 5545 (Advanced Computer Graphics), choose from (5544 (scientific visualizatin), 5559, 5912 (Game Design Capstone), 5913 (Computer Animation Capstone))

Minor

Required: 5542 (Real-time Rendering)
and choose from (5541 (Computer Game and Animation Techniques), 5543 (Geometric Modeling), 5544 (Scientific Viz) 5559, 5912 (Game Design Capstone), 5913 (Computer Animation Capstone))
Theory and Algorithms

Group 1:

CSE 6321 (725) Computability and Complexity (if not used for qualification)
CSE 6332 (794Q/790) Advanced Algorithms
CSE 6333 (763) Intro to Distributed Computing
CSE 5543 (784) Geometric Modelling
CSE 5539 (788) (Computational Geometry/Randomized algorithms and other courses offered by theory faculty)
CSE 5351 (794Q/723) Introduction to Cryptography

Group 2:
Math 4547, 4548 (547, 548, 549) Analysis
Math 4575 (575) Combinatorial Mathematics and Graph Theory
Math 4578 (578) Discrete Mathematical Models
Math 5051 (648, 649) Mathematical Logic
Math 5801 (655, 656, 657) Topology
Math (674) Survey of Combinatorial Mathematics
Math 6501, 6502 (775, 776, 777) Combinatorics and Graph Theory
Math 6251, 6252 (722, 723, 724) Probability
ISE (702) Mathematical Programming: Linear
ISE 5200 (720) Linear Optimization
Stat 6201 (520, 521) Mathematical Statistics

Major: 10 semester credit hours. At least 2 courses from group 1, one of which must not be number 5xx9.
Minor: 6 semester credit hours. At least one group 1 course not numbered 5xx9.

Software Systems

Major:
Required Courses
one of 5242 or 5243 (770/674 replacements)
one of 6333 or 6431 (763/760 replacements)

Electives
5241 670 + 1/2 671
5243 674 replacement
5915  772 replacement
6431  760 replacement (if not counted for qualification process)
5433  662 replacement
5343  756 replacement
5245  new network analysis course
5249  788.02 replacement
5439  788.06 replacement
5449  788.11 replacement

Minor:

DB Track:
One (or both) of 5242, 5243 (770, 674 replacement)
Other credits from 5241, 5245, 5915, 5249, 6249 (888.02 replacement)

Distributed Computing Track:
credits from 6333, 6431 (if not used for qualification process), 5433, 5449, 5439, 6449 (888.11 replacement), 6439 (888.06 replacement)

**Artificial Intelligence:**

Major: 730, (779 or 735), remaining from (634, 732/733, including up to one 788)

AI Minor: (630 or 730), remaining from any other graded AI courses (including up to one 788)

Which translates into:

AI Major: 5522, (5523 or 5526), remaining from (5524, 5525, including up to one 5539)

AI Minor: (5521 or 5522), remaining from any other graded AI courses (including up to one 5539).